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(71)(72) Applicant and Inventor: GREENBERG, Ronald, Allan [AU/AU]; 41 Kintyre Road, Woodforde, S.A. 5072 (AU).

(74) Agent: COLLISON & CO.; 117 King William Street, Adelaide, S.A. 5000 (AU).

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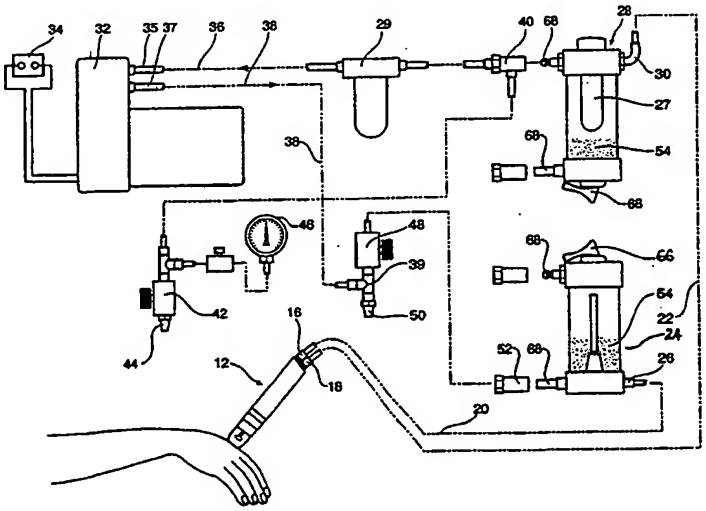
(54) Title: IMPROVED APPARATUS AND METHOD FOR MICRO–ABRASIONS OF HUMAN TISSUE AND/OR HIDES



(57) Abstract

The invention relates to an apparatus for making micro–abrasions including a handle (12) having an inlet passage (16) and an outlet passage (18) communicating with an aperture (14) in said handle (12). The aperture (14) in use is adapted to be positioned on a surface to be treated, such as the skin, and a pneumatic means provides a variable supply of abrasive particles to the aperture (14) of the handle. The pneumatic means includes a vacuum source (32) having a suction outlet (35) that is operatively connected to the outlet passage (18) of the handle (12) and an exhaust outlet (37) that is operatively connected to the inlet passage (16) of the handle (12), to thereby cause the abrasive particles from the supply container (24) to flow through said handle (12). By providing both a suction and a pressurised effect the particles are caused to flow much more freely and assist in making micro–abrasions on a skin surface that is being treated.

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IMPROVED APPARATUS AND METHOD FOR MICRO-ABRASIONS OF HUMAN TISSUE AND/OR HIDES

This invention is for an apparatus and method for making micro-abrasions, particularly on human tissue or on hides.

FIELD OF THE INVENTION

The present invention relates in general to an apparatus and method for making micro-abrasions, particularly for cosmetic treatment of human tissue such as the removal of scars and other skin blemishes but may also be used for therapeutic treatment. In addition, the invention can be used to treat hide or other similar type of materials which require fine abrasion to remove particular attributes.

Apparatus and methods for making micro-abrasions are known but which rely exclusively on a vacuum source to provide a pneumatic carrier ability for abrasive particles. It has been found that this method and apparatus provides insufficient abrasive properties to properly treat human tissues or skin working simply on the basis of a vacuum source.

SUMMARY OF THE INVENTION

Therefore, according to one form of the invention there is proposed an apparatus for making micro-abrasion including:

a handle having an inlet passage and an outlet passage communicating with an aperture in said handle, said aperture adapted to be positioned on the surface to be treated;

a pneumatic means for the variable supply of abrasive particles in a pneumatic carrier to the aperture of the handle whereby the supply means includes a vacuum source whose suction outlet is connected to the outlet passage of the handle and whose exhaust outlet is connected to the inlet passage of the handle, to thereby cause the abrasive particles from the supply container to flow through said handle.

In preference, the amount of suction may be regulated by a regulator connected to the atmosphere.

In preference, the positive air pressure entering said inlet handle is regulated by the use of a regulator connected to the supply container.

Preferably, said supply container is heated so as to heat the abrasive particles.

BRIEF DESCRIPTION OF THE DRAWINGS

To further assist in understanding the invention reference is now made to the following figures in which:

FIG 1 is a perspective view of the apparatus;

FIG 2 is a schematic of the invention;

FIG 3 is a perspective view of a first embodiment of the handle;

FIG 4 is a cross-sectional view of the handle of Figure 3;

FIG 5 is a cross-sectional view of the supply container;

FIG 6 is a cross-sectional view of a handle according to a second embodiment; and

FIG 7 is a close up view of the handle of FIG 6 in use.

BEST MODE OF THE INVENTION

Turning now to the figures in detail there is shown in FIG 1 an apparatus 10 for making abrasions including a handle 12 having an aperture 14 an inlet passage 16 and an outlet passage 18, said inlet passage 16 being connected by an inlet tube 20 to a supply container 24 via supply connector 26. Outlet tube 22 is connected to recovery container 28 via recovery connector 30.

An electric vacuum pump 32 operable by switch 34 has a suction outlet 35 which provides suction through tube 36 that passes through filter 29 and a three-way suction connector 40, one end of which is fed into the recovery container 28 and a second end of which is connected to a suction regulator 42 and vacuum gauge 46. The suction regulator 42 has a suction aperture 44 in connection with the atmosphere. The filter 29 ensures that any particulates within the tube 36 do not enter the vacuum pump 32 and potentially damage it.

The electric vacuum pump 32 includes an exhaust outlet 37 which is connected via pressurised tube 38 to a three-way pressure connector 39 one outlet of which is an aperture 50 in connection with the atmosphere whilst the other is fed into a flow regulator 48 itself connected to pressure connector 52.

In use, after the electric vacuum pump 32 has been activated, it provides suction through suction outlet 35, suction tube 36, filter 29, three way suction container 40 to the recovery container 28 and then through the recovery connector 30 the outlet tube 22, through the outlet passage 18 and through the handle 12. When the aperture 14 is applied against a surface to be

treated, the suction causes air to be then sucked through the inlet passage 16 inlet tube 20 supply connector 26 to the supply container 24 and therefore causes the reducing substances 54 to be sucked or flow back through that arrangement and be collected in the recovery container 28. To ensure that the particles remain in the recovery container 28 the container has a filter 27 with apertures that are smaller than the particulates thus ensuring that they remain within the recovery container. In the case where some of the particles may be sucked though the tube 36, the filter 29 ensures that potentially none reach into the vacuum pump. This double-filtering action therefore protects the vacuum pump from potential damage.

The suction may be regulated by the suction regulator 42 which allows the introduction of atmospheric air through suction aperture 44, the vacuum being indicated by the vacuum gauge 46. For maximum suction, the suction regulator 42 is closed so that no outside air enters the system through suction aperture 44. To reduce the amount of suction and thus the amount of reducing substances 54 being sucked from the supply container 24 and thus flowing through the handle the suction regulator may be slightly opened to allow outside air to enter the system.

At the same time the exhaust outlet 37 from the vacuum pump pressurises tube 38 and is fed into the supply container 24 through a three-way pressure connector 39 and flow regulator 48. By closing the flow regulator 48 all of the pressurised air from the exhaust outlet exits to the atmosphere through aperture 50. When the flow regulator 48 is opened, the pressure causes air to flow into supply container 24 through pressure corrector 52 to enable the reducing substances to flow to the handle 12. As shown in more detail in Figure 5, the pressurised air flows into the supply container through distributor 56 which is made from a fine mesh material whose size is of the same order or smaller than the particle sizes. The flow of air 58 out through the distributor 56 causes the particulates to be aired and which then enter collection tube 60 through aperture 62. The collection tube is chosen to be of a sufficient height to ensure that the particulates do not directly enter into the tube but rather through the aperture 56. After passing through the aperture 62 the particulates flow through passageway 64 , through supply connector 26 and into the inlet tube 20.

Accordingly, as a result of the pressurised supply container and the vacuum, the reducing substances 54 held in supply container 24 are pneumatically transported to the handle 12 and the aperture 14 by the assistance of both a vacuum source and a pressure source and thus pass over the region of the

surface to be treated defined by the aperture 14 and thereby causing micro-abrasions. The reducing substances, together with any particles and detritus removed from the surface being treated are then sucked through the outlet passage 18 outlet tube 22 and into recovery container 28 to be thereafter disposed of.

Both the recovery and supply containers are fitted with quick release seals 66 that allow access to the bottom of the recovery container enabling it to be emptied of particulate and to the top of supply container 24 enabling particulates to be added. In addition, both the supply and recovery containers are mounted on the side of the apparatus via quick release connectors 68 allowing them to be removed for cleaning, storage, replacement or transportation purposes.

Obviously the degree of micro-abrasion caused on the surface is adjustable by operating both the suction regulator 42 and the flow regulator 48 associated with the electric vacuum pump 32. however it has been shown that the system is virtually ineffective if there is no pressurisation within the system and a degree of this always has to be present for the apparatus to effectively work.

Figures 3 and 4 exhibit in further detail a first embodiment of the handle 12. The handle 12 as discussed above includes aperture 14 and is connected to inlet and outlet tubes 20 and 22 by connectors 16 and 18 respectively. Disposed within the handle 12 are two passageways, passageway 70 operatively connected with inlet tube 20 and passageway 72 operatively connected to outlet tube 22. Removably attached over the end of the handle 12 adjacent the ends of passageways 70 and 72 is cap 74 within which is disposed aperture 14. The axis of the aperture 14 is substantially coaxially aligned with the longitudinal axis of the end of supply passageway 70 with the plane of the aperture being substantially perpendicular to the coaxial axis of the end of passageway 70. Also disposed within the end of passageway 70 is a hollowed length adjustable rod 76 that allows particulates to flow therethrough and allows for the adjustment of the distance between the effective end of passageway 70 and the aperture 14. By adjusting the distance one can adjust the amount of dispersal of the particulates by the time they reach the aperture. In this particular embodiment the length adjustability is accomplished by the rod being screwable into the end of passageway 70 allowing the distance to be adjusted by the use of a screwdriver which engages slit 78 at the end of rod 76. In addition the dimension of the hollow of the rod can also be chosen to

be less than that of the passageway and thereby adjust the flow of particulates therethrough. To ensure that there is a good seal between the cap 74 and the rest of the handle there may be an 'O' ring 80.

Figures 6 and 7 show a second embodiment of the handle including an inlet passage 16 and an outlet passage 18. Positioned at the end of inlet passage 16 is plug 82 which is so shaped so as to reduce the diameter of the inlet passage 16 and thereby affect the number of reducing substances or particles 54 passing through the inlet tube 16 and through handle 12. To adjust the position of the plug 82 in relation to the aperture 14 the inlet tube 16 can be affixed relative to the handle by the use of a nut 84 which engages both the handle 12 and the inlet tube 16. Similarly the outlet passage 18 is fixed in place by a similar type of nut 60.

As indicated in Figure 7 reducing substances 54 are caused to impact the surface to be treated 86 with the reducing substances causing micro-abrasions of the surface and the residual of both the reducing substances 54 and particles of skin 88 is sucked up through outlet passage 18 and into the recovery container.

Thus one can see that due to the use of the exhaust outlet 37 of the vacuum pump 32 particles will be caused to flow through the system even when external air enters the system through aperture 14 when the aperture is not placed abutting the surface of the treated thereby not being a closed system. By sealingly placing said aperture 14 against surface 86 the vacuum in the inlet tube 16 is increased to thereby cause an increase in the flow of particles which can be regulated by the use of the suction regulator 42 and the flow regulator 48.

The foregoing describes only one embodiment of the present invention and modifications, obvious to those skilled in the art, can be made thereto without departing from the scope of the present invention. For example, the inlet tube 20 passing through supply 26 may open into a manifold structure within the supply container to include multiple holes and shaking filters (not shown). The supply container may also include an electrical heating means to thereby heat the reducing substance and improve the micro-abrasion effect.

To assist in using the apparatus other instrumentation may be attached to the apparatus such a timer 90 to ensure that the length of the treatment does not exceed the necessary levels.

Thus one can see that the present apparatus provides for the flow of abrasive particles though not only suction but a positive pressure. By providing both a suction and a pressurised effect the particles are caused to flow much more freely and assist in making microabrasions on a skin surface that is being treated.

Furthermore, the vacuum pump could be replaced by equivalent means adapted to create a pneumatic system to cause the reducing substances to flow through the loop.

Throughout this specification the above description has been intended to illustrate the invention and not to limit it thus,. Other embodiments may equally well be applied by those skilled in the art without deviating form the scope of the invention.

CLAIMS

1. An apparatus for making micro-abrasions including:

a handle having an inlet passage and an outlet passage communicating with an aperture in said handle, said aperture adapted to be positioned on a surface to be treated;

a pneumatic means for the variable supply of abrasive particles in a pneumatic carrier to the aperture of the handle whereby the pneumatic means includes a vacuum source having a suction outlet that is operatively connected to the outlet passage of the handle and an exhaust outlet that is operatively connected to the inlet passage of the handle, to thereby cause the abrasive particles from the supply container to flow through said handle.

2. An apparatus for making microabrasions as in any one of the above claims including an outlet regulator in communication with the outlet passage and the atmosphere so as to control the amount of air entering the pneumatic means.

3. An apparatus for making microabrasions as in any one of the above claims including an inlet regulator in communication with the inlet passage and the atmosphere so as to control the amount of air exiting said pneumatic means.

4. An apparatus for making microabrasions as in any one of the above claims including a supply container of said abrasive particles, said supply container being in communication with the exhaust outlet.

5. An apparatus for making microabrasions as in any one of the above claims including a recovery container for recovering said particles, said recovery container being in communication with the suction outlet.

6. An apparatus for making microabrasions as in claim 5 wherein said recovery container includes a filter means so as to prevent said abrasive particles from flowing into said pneumatic means.

7. An apparatus for making microabrasions as in any one of the above claims wherein said pneumatic means is a vacuum pump.

8. An apparatus for making microabrasions as in claim 5 wherein fluidly located between the suction outlet and the recovery container is a filter so as to prevent particulates from being sucked into the pneumatic means.

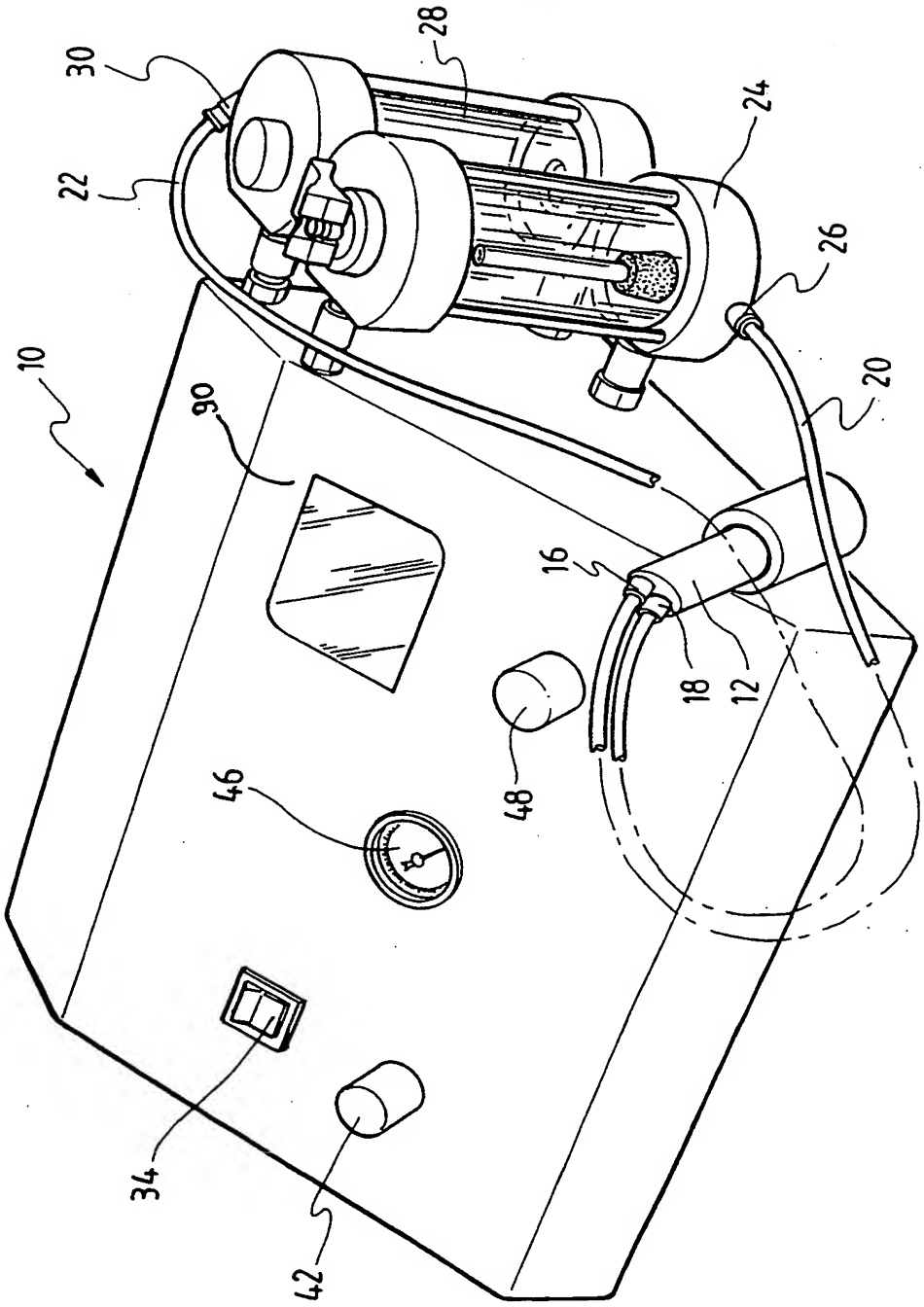

FIG 1

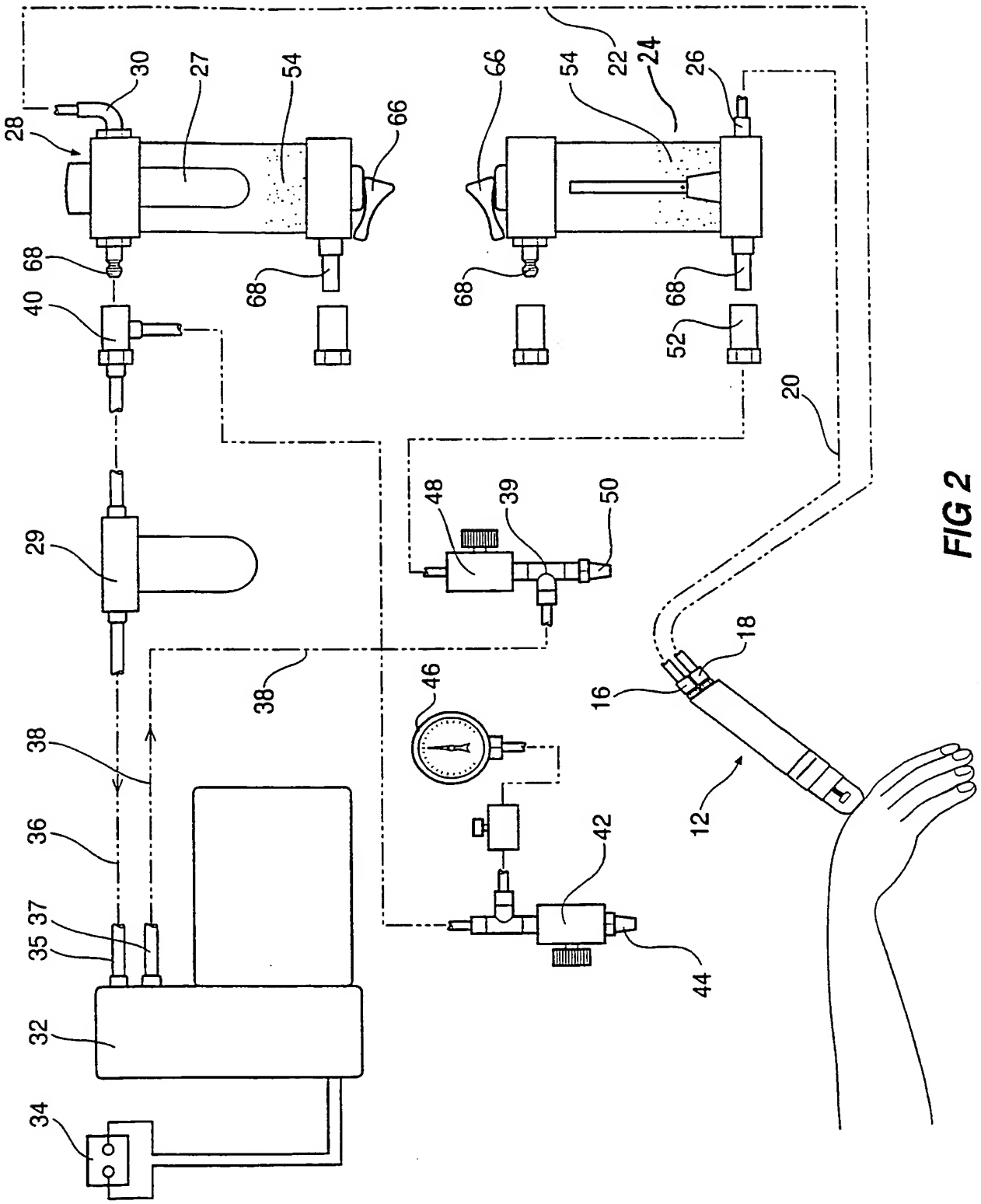

FIG 2

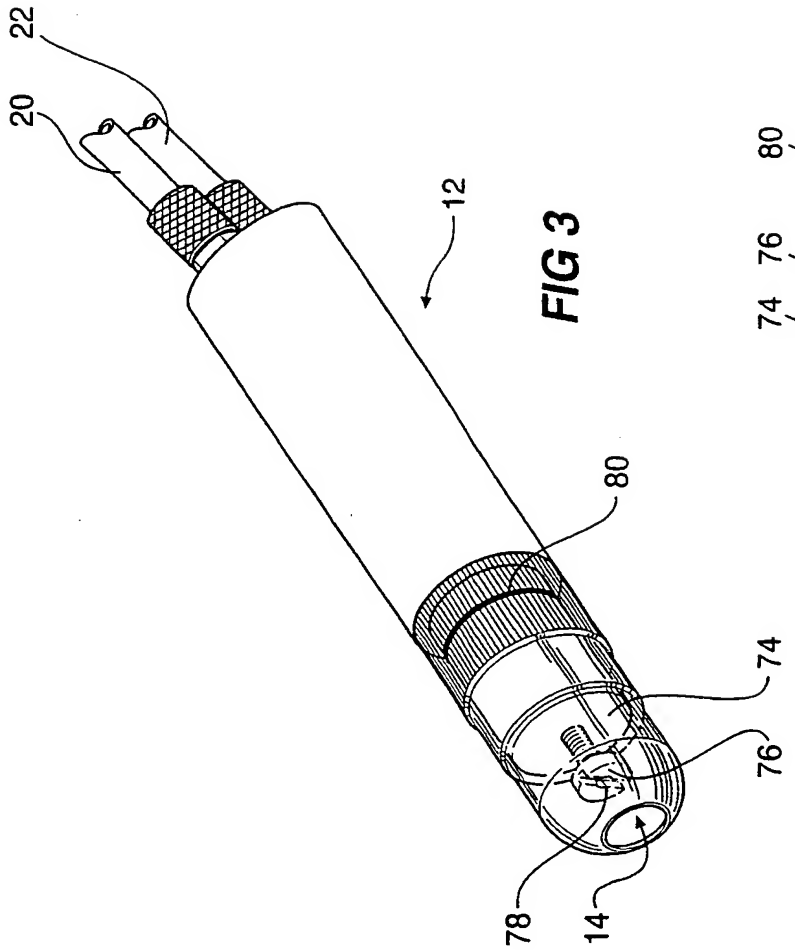

FIG 3

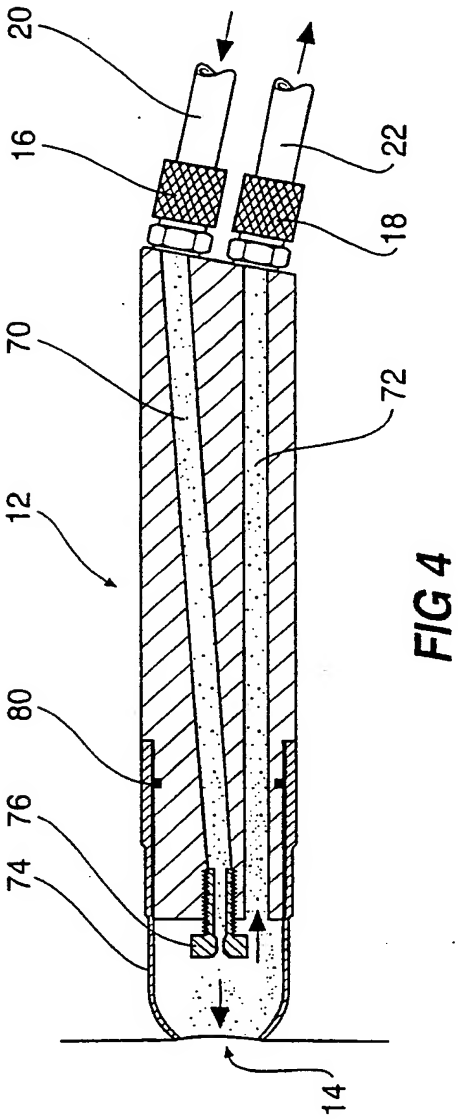

FIG 4

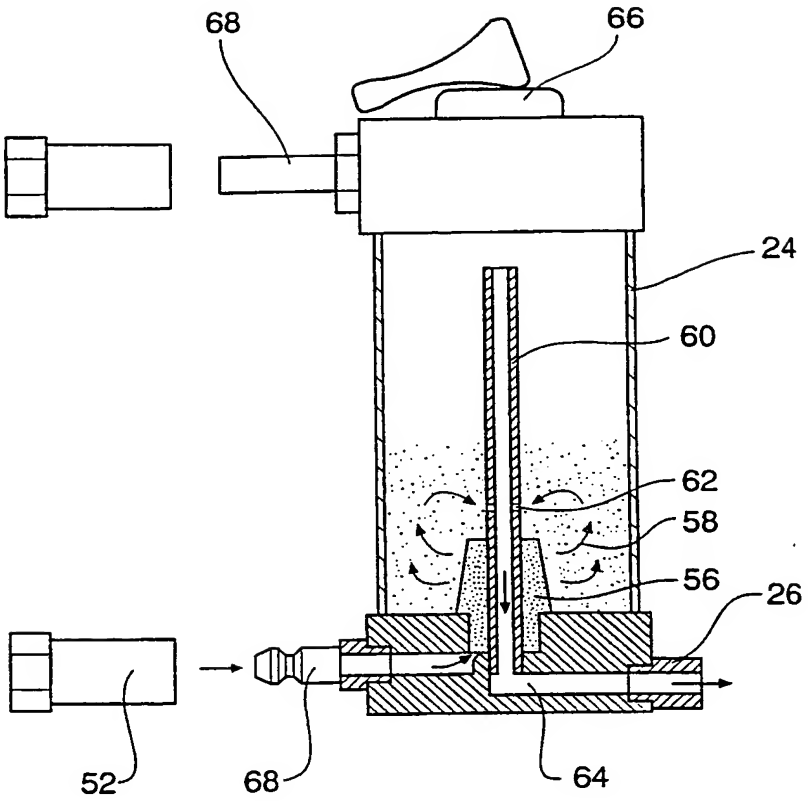

FIG 5

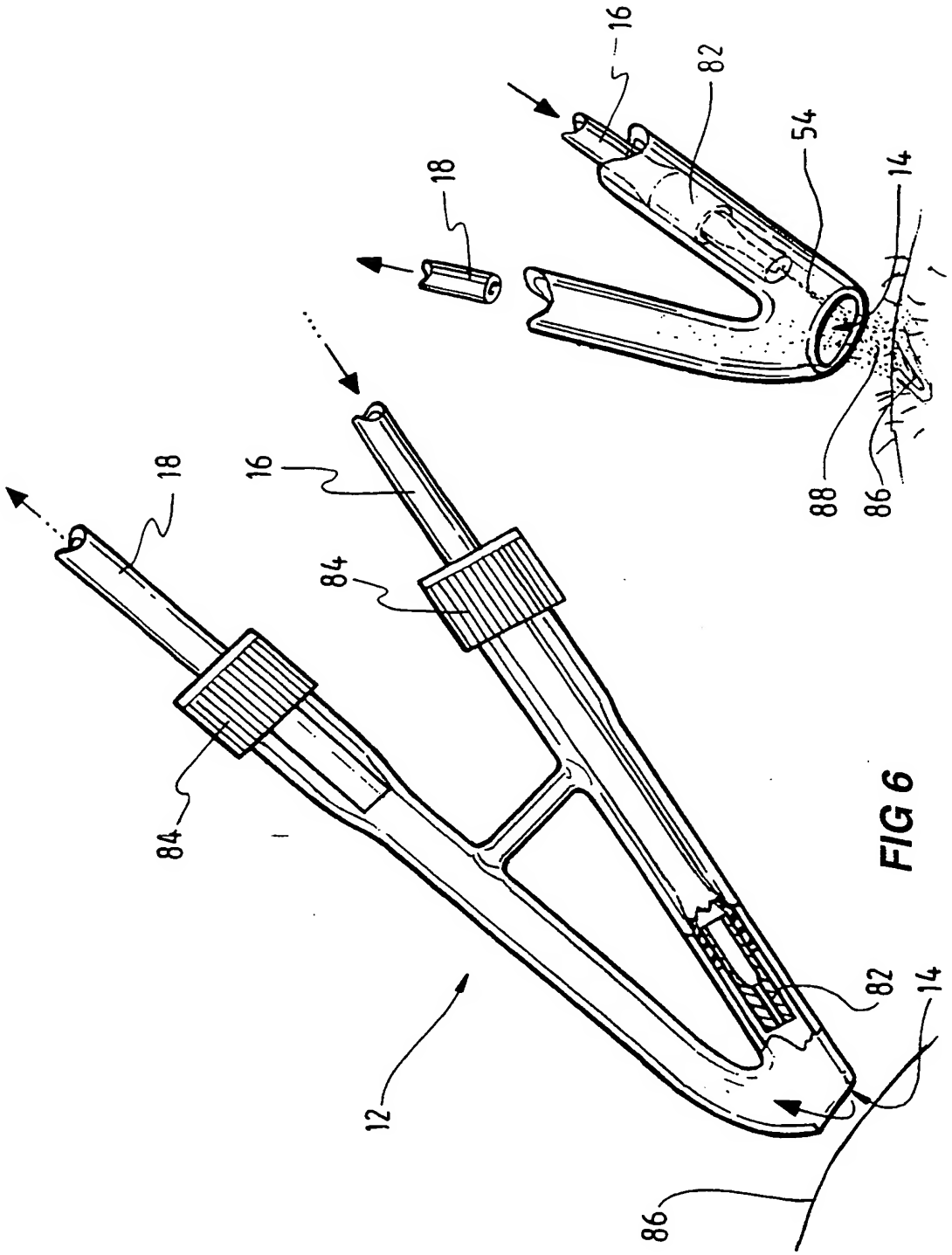

FIG 7

FIG 6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU 98/00936

A. CLASSIFICATION OF SUBJECT MATTER

Int Cl[6]: A61B 17/00 C14B 1/46

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B C14B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 564392 A (FRUCTUOSO MARTINEZ) 6 October 1993 column 3 lines 41-44	1-8, 10-12, 17
X	WO 97/11650 A (CAWLEY) 3 April 1997 page 10 line 1 - page 11 line 11	1-8, 10-17
X	EP 318042 A (MOLLNARI et al) 31 May 1989 column 2 lines 27-36	1, 4-8, 10, 12, 13, 15-17

[X] Further documents are listed in the continuation of Box C

[X] See patent family annex

* Special categories of cited documents:

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Date of the actual completion of the international search	Date of mailing of the international search report
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Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200 WODEN ACT 2606 AUSTRALIA Facsimile No.: (02) 6285 3929	Authorized officer D Melhuish DAVID MELHUISH Telephone No.: (02) 6283 2426

INTERNATIONAL SEARCH REPORT

international application No.
PCT/AU 98/00936

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	EP 806184 A (MATTIOLI ENGINEERING S.R.L.) 12 November 1997 column 2 line 55 - column 3 line 20	1-8, 10-13, 15, 16
A	EP 324448 A (L.I.C.A. di ROSSO & C. S.N.C) 19 July 1989 abstract	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/AU 98/00936

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
EP	564392						
WO	97/11650	AU	70919/96	GB	2319480		
EP	318042	US	5037432				
EP	806184	IT	96300108	JP	10043188		
EP	324448	AU	29248/89	BR	8907135	HU	55211
		IT	1218945	US	5100412	US	5207234
		WO	89/06113				

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(71) Applicant and
(72) Inventor: GREENBERG, Ronald, Allan [AU/AU]; 41 Kintyre Road, Woodforde, S.A. 5072 (AU).

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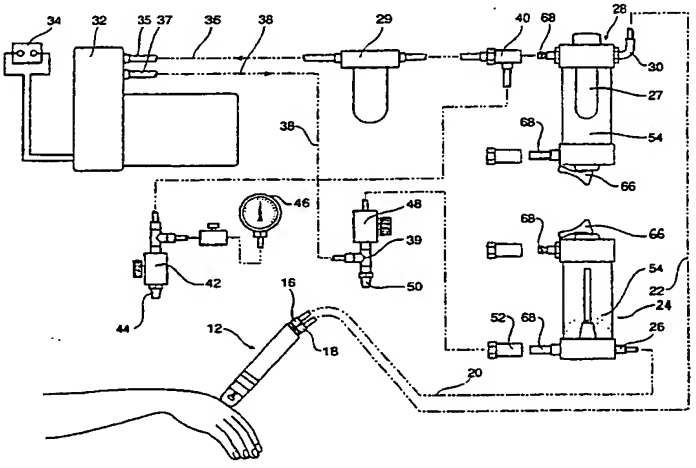

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WO 99/23951 A1

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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BEST MODE OF THE INVENTION

Turning now to the figures in detail there is shown in FIG 1 an apparatus 10 for making abrasions including a handle 12 having an aperture 14 an inlet passage 16 and an outlet passage 18, said inlet passage 16 being connected by an inlet tube 20 to a supply container 24 via supply connector 26. Outlet tube 22 is connected to recovery container 28 via recovery connector 30.

An electric vacuum pump 32 operable by switch 34 has a suction outlet 35 which provides suction through tube 36 that passes through filter 29 and a three-way suction connector 40, one end of which is fed into the recovery container 28 and a second end of which is connected to a suction regulator 42 and vacuum gauge 46. The suction regulator 42 has a suction aperture 44 in connection with the atmosphere. The filter 29 ensures that any particulates within the tube 36 do not enter the vacuum pump 32 and potentially damage it.

The electric vacuum pump 32 includes an exhaust outlet 37 which is connected via pressurised tube 38 to a three-way pressure connector 39 one outlet of which is an aperture 50 in connection with the atmosphere whilst the other is fed into a flow regulator 48 itself connected to pressure connector 52.

In use, after the electric vacuum pump 32 has been activated, it provides suction through suction outlet 35, suction tube 36, filter 29, three way suction container 40 to the recovery container 28 and then through the recovery connector 30 the outlet tube 22, through the outlet passage 18 and through the handle 12. When the aperture 14 is applied against a surface to be

treated, the suction causes air to be then sucked through the inlet passage 16 inlet tube 20 supply connector 26 to the supply container 24 and therefore causes the reducing substances 54 to be sucked or flow back through that arrangement and be collected in the recovery container 28. To ensure that the particles remain in the recovery container 28 the container has a filter 27 with apertures that are smaller than the particulates thus ensuring that they remain within the recovery container. In the case where some of the particles may be sucked though the tube 36, the filter 29 ensures that potentially none reach into the vacuum pump. This double-filtering action therefore protects the vacuum pump from potential damage.

The suction may be regulated by the suction regulator 42 which allows the introduction of atmospheric air through suction aperture 44, the vacuum being indicated by the vacuum gauge 46. For maximum suction, the suction regulator 42 is closed so that no outside air enters the system through suction aperture 44. To reduce the amount of suction and thus the amount of reducing substances 54 being sucked from the supply container 24 and thus flowing through the handle the suction regulator may be slightly opened to allow outside air to enter the system.

At the same time the exhaust outlet 37 from the vacuum pump pressurises tube 38 and is fed into the supply container 24 through a three-way pressure connector 39 and flow regulator 48. By closing the flow regulator 48 all of the pressurised air from the exhaust outlet exits to the atmosphere through aperture 50. When the flow regulator 48 is opened, the pressure causes air to flow into supply container 24 through pressure corrector 52 to enable the reducing substances to flow to the handle 12. As shown in more detail in Figure 5, the pressurised air flows into the supply container through distributor 56 which is made from a fine mesh material whose size is of the same order or smaller than the particle sizes. The flow of air 58 out through the distributor 56 causes the particulates to be aired and which then enter collection tube 60 through aperture 62. The collection tube is chosen to be of a sufficient height to ensure that the particulates do not directly enter into the tube but rather through the aperture 56. After passing through the aperture 62 the particulates flow through passageway 64 , through supply connector 26 and into the inlet tube 20.

Accordingly, as a result of the pressurised supply container and the vacuum, the reducing substances 54 held in supply container 24 are pneumatically transported to the handle 12 and the aperture 14 by the assistance of both a vacuum source and a pressure source and thus pass over the region of the

surface to be treated defined by the aperture 14 and thereby causing micro-abrasions. The reducing substances, together with any particles and detritus removed from the surface being treated are then sucked through the outlet passage 18 outlet tube 22 and into recovery container 28 to be thereafter disposed of.

Both the recovery and supply containers are fitted with quick release seals 66 that allow access to the bottom of the recovery container enabling it to be emptied of particulate and to the top of supply container 24 enabling particulates to be added. In addition, both the supply and recovery containers are mounted on the side of the apparatus via quick release connectors 68 allowing them to be removed for cleaning, storage, replacement or transportation purposes.

Obviously the degree of micro-abrasion caused on the surface is adjustable by operating both the suction regulator 42 and the flow regulator 48 associated with the electric vacuum pump 32. however it has been shown that the system is virtually ineffective if there is no pressurisation within the system and a degree of this always has to be present for the apparatus to effectively work.

Figures 3 and 4 exhibit in further detail a first embodiment of the handle 12. The handle 12 as discussed above includes aperture 14 and is connected to inlet and outlet tubes 20 and 22 by connectors 16 and 18 respectively. Disposed within the handle 12 are two passageways, passageway 70 operatively connected with inlet tube 20 and passageway 72 operatively connected to outlet tube 22. Removably attached over the end of the handle 12 adjacent the ends of passageways 70 and 72 is cap 74 within which is disposed aperture 14. The axis of the aperture 14 is substantially coaxially aligned with the longitudinal axis of the end of supply passageway 70 with the plane of the aperture being substantially perpendicular to the coaxial axis of the end of passageway 70. Also disposed within the end of passageway 70 is a hollowed length adjustable rod 76 that allows particulates to flow therethrough and allows for the adjustment of the distance between the effective end of passageway 70 and the aperture 14. By adjusting the distance one can adjust the amount of dispersal of the particulates by the time they reach the aperture. In this particular embodiment the length adjustability is accomplished by the rod being screwable into the end of passageway 70 allowing the distance to be adjusted by the use of a screwdriver which engages slit 78 at the end of rod 76. In addition the dimension of the hollow of the rod can also be chosen to

be less than that of the passageway and thereby adjust the flow of particulates therethrough. To ensure that there is a good seal between the cap 74 and the rest of the handle there may be an 'O' ring 80.

Figures 6 and 7 show a second embodiment of the handle including an inlet passage 16 and an outlet passage 18. Positioned at the end of inlet passage 16 is plug 82 which is so shaped so as to reduce the diameter of the inlet passage 16 and thereby affect the number of reducing substances or particles 54 passing through the inlet tube 16 and through handle 12. To adjust the position of the plug 82 in relation to the aperture 14 the inlet tube 16 can be affixed relative to the handle by the use of a nut 84 which engages both the handle 12 and the inlet tube 16. Similarly the outlet passage 18 is fixed in place by a similar type of nut 60.

As indicated in Figure 7 reducing substances 54 are caused to impact the surface to be treated 86 with the reducing substances causing micro-abrasions of the surface and the residual of both the reducing substances 54 and particles of skin 88 is sucked up through outlet passage 18 and into the recovery container.

Thus one can see that due to the use of the exhaust outlet 37 of the vacuum pump 32 particles will be caused to flow through the system even when external air enters the system through aperture 14 when the aperture is not placed abutting the surface of the treated thereby not being a closed system. By sealingly placing said aperture 14 against surface 86 the vacuum in the inlet tube 16 is increased to thereby cause an increase in the flow of particles which can be regulated by the use of the suction regulator 42 and the flow regulator 48.

The foregoing describes only one embodiment of the present invention and modifications, obvious to those skilled in the art, can be made thereto without departing from the scope of the present invention. For example, the inlet tube 20 passing through supply 26 may open into a manifold structure within the supply container to include multiple holes and shaking filters (not shown). The supply container may also include an electrical heating means to thereby heat the reducing substance and improve the micro-abrasion effect.

To assist in using the apparatus other instrumentation may be attached to the apparatus such a timer 90 to ensure that the length of the treatment does not exceed the necessary levels.

Thus one can see that the present apparatus provides for the flow of abrasive particles though not only suction but a positive pressure. By providing both a suction and a pressurised effect the particles are caused to flow much more freely and assist in making microabrasions on a skin surface that is being treated.

Furthermore, the vacuum pump could be replaced by equivalent means adapted to create a pneumatic system to cause the reducing substances to flow through the loop.

Throughout this specification the above description has been intended to illustrate the invention and not to limit it thus,. Other embodiments may equally well be applied by those skilled in the art without deviating form the scope of the invention.

CLAIMS

1. An apparatus for making micro-abrasions including:

a handle having an inlet passage and an outlet passage communicating with an aperture in said handle, said aperture adapted to be positioned on a surface to be treated;

a pneumatic means for the variable supply of abrasive particles in a pneumatic carrier to the aperture of the handle whereby the pneumatic means includes a vacuum source having a suction outlet that is operatively connected to the outlet passage of the handle and an exhaust outlet that is operatively connected to the inlet passage of the handle, to thereby cause the abrasive particles from the supply container to flow through said handle.

2. An apparatus for making microabrasions as in any one of the above claims including an outlet regulator in communication with the outlet passage and the atmosphere so as to control the amount of air entering the pneumatic means.

3. An apparatus for making microabrasions as in any one of the above claims including an inlet regulator in communication with the inlet passage and the atmosphere so as to control the amount of air exiting said pneumatic means.

4. An apparatus for making microabrasions as in any one of the above claims including a supply container of said abrasive particles, said supply container being in communication with the exhaust outlet.

5. An apparatus for making microabrasions as in any one of the above claims including a recovery container for recovering said particles, said recovery container being in communication with the suction outlet.

6. An apparatus for making microabrasions as in claim 5 wherein said recovery container includes a filter means so as to prevent said abrasive particles from flowing into said pneumatic means.

7. An apparatus for making microabrasions as in any one of the above claims wherein said pneumatic means is a vacuum pump.

8. An apparatus for making microabrasions as in claim 5 wherein fluidly located between the suction outlet and the recovery container is a filter so as to prevent particulates from being sucked into the pneumatic means.

9. An apparatus for making microabrasions as in any one of the above claims wherein said supply container includes a heater to heat said particulates.

10. An apparatus for making microabrasions as in any one claims 3 to 6 wherein said inlet regulator includes a vacuum gauge so as to provide an indication of the vacuum within the pneumatic means.

11. An apparatus for making microabrasions as in any one of the above claims wherein said recovery container includes an access valve allowing access to said recovery container.

12. An apparatus for making microabrasions as in any one of the above claims wherein said supply container includes an access valve allowing access to said supply container.

13. An apparatus for making microabrasions as in any one of the above claims wherein said handle includes a supply passageway and a recovery passageway, said supply passageway including a free end to which is attached a hollow rod.

14. An apparatus for making microabrasions as in claim 13 wherein said hollow rod is extendible with respect to said passageway to thereby vary the distance between said passageway and the aperture.

15. An apparatus for making microabrasions as in claims 13 or 14 wherein the longitudinal axis of the rod and the aperture are substantially parallel.

16. An apparatus for making microabrasions as any one of claims 13 to 15 wherein the plane of said aperture is substantially orthogonal to the longitudinal axis of said hollow rod.

17. An apparatus for making microabrasions as in any one of the above claims wherein said aperture is disposed within a cap removably attachable to said handle.

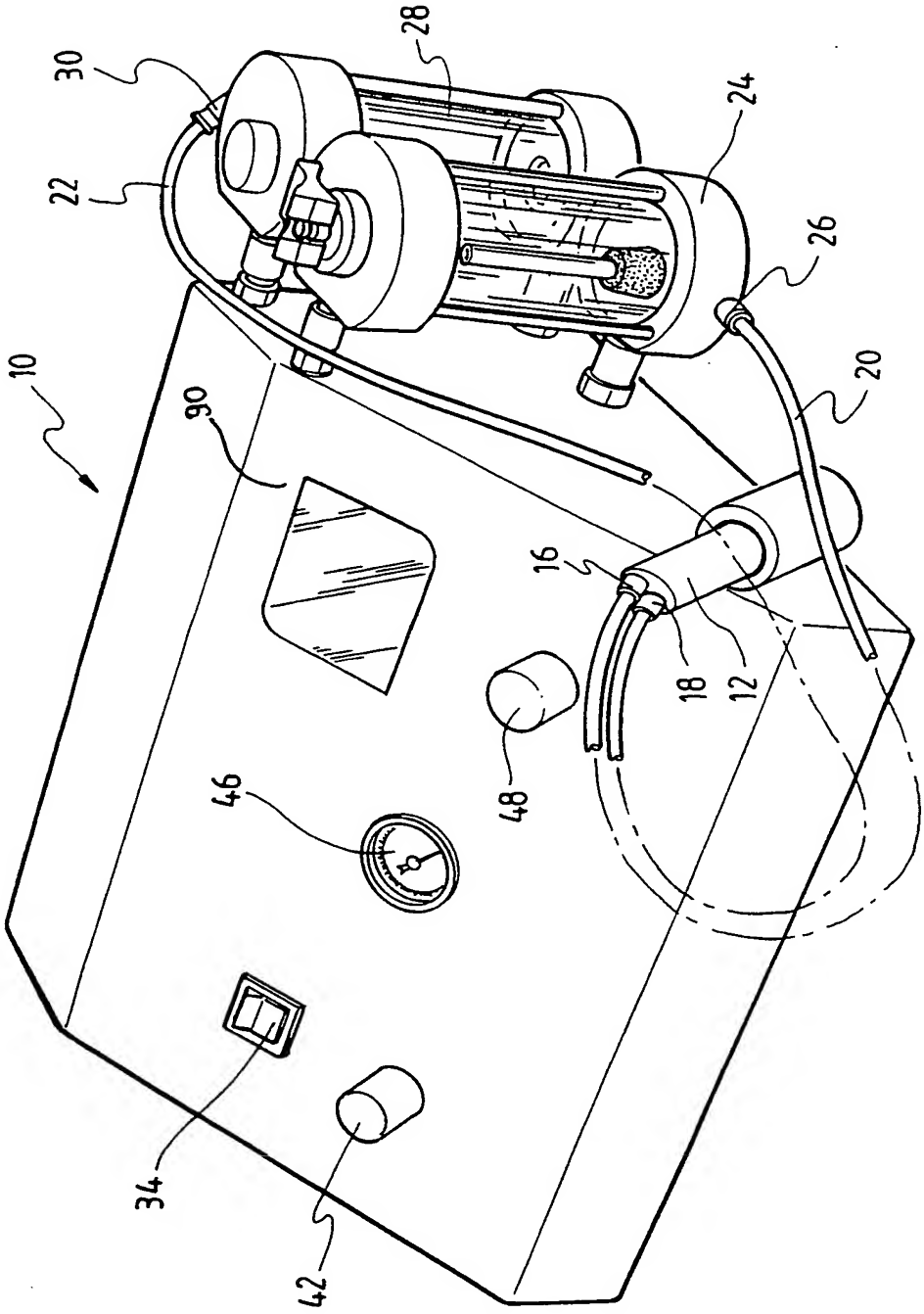

FIG 1

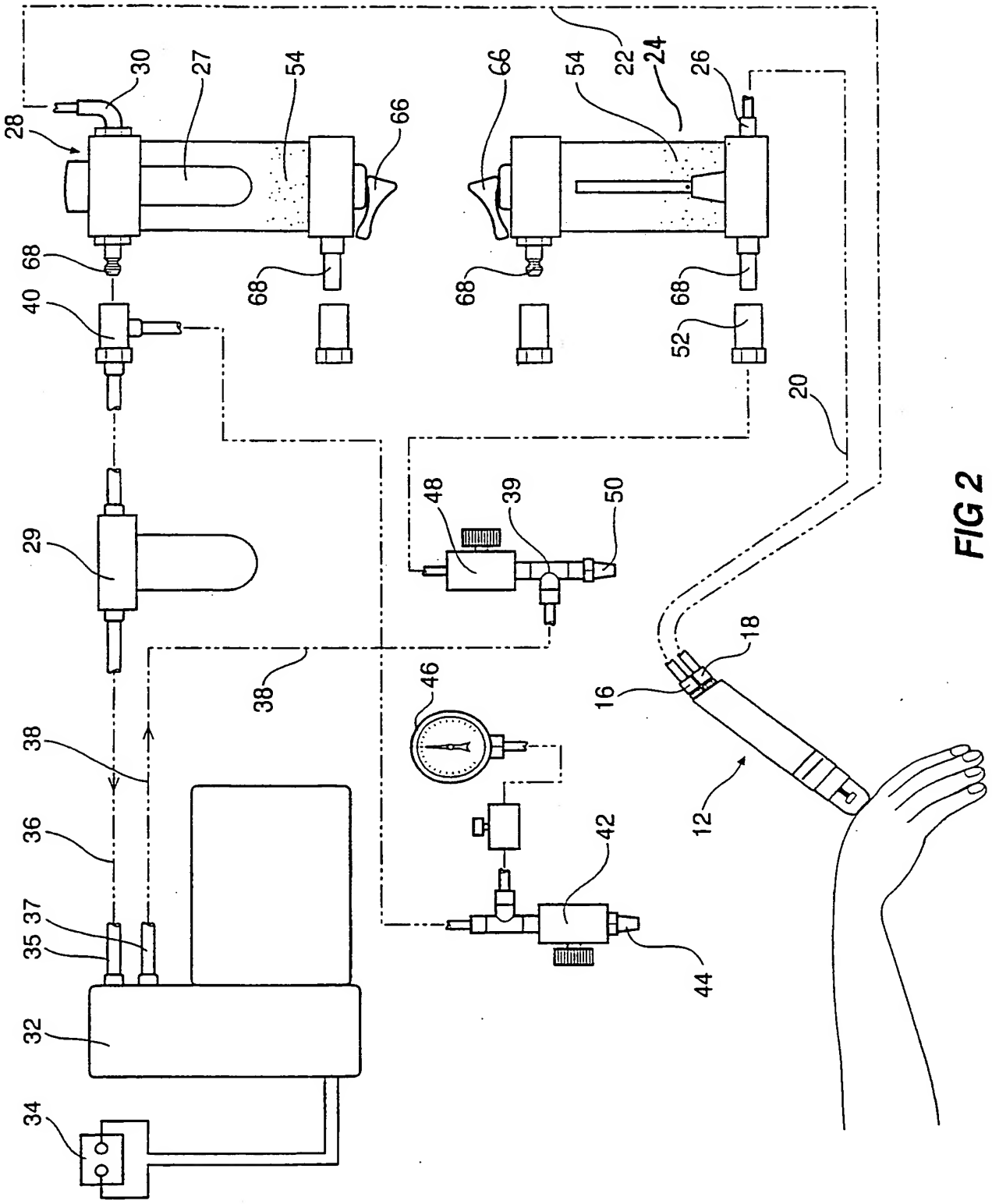

FIG 2

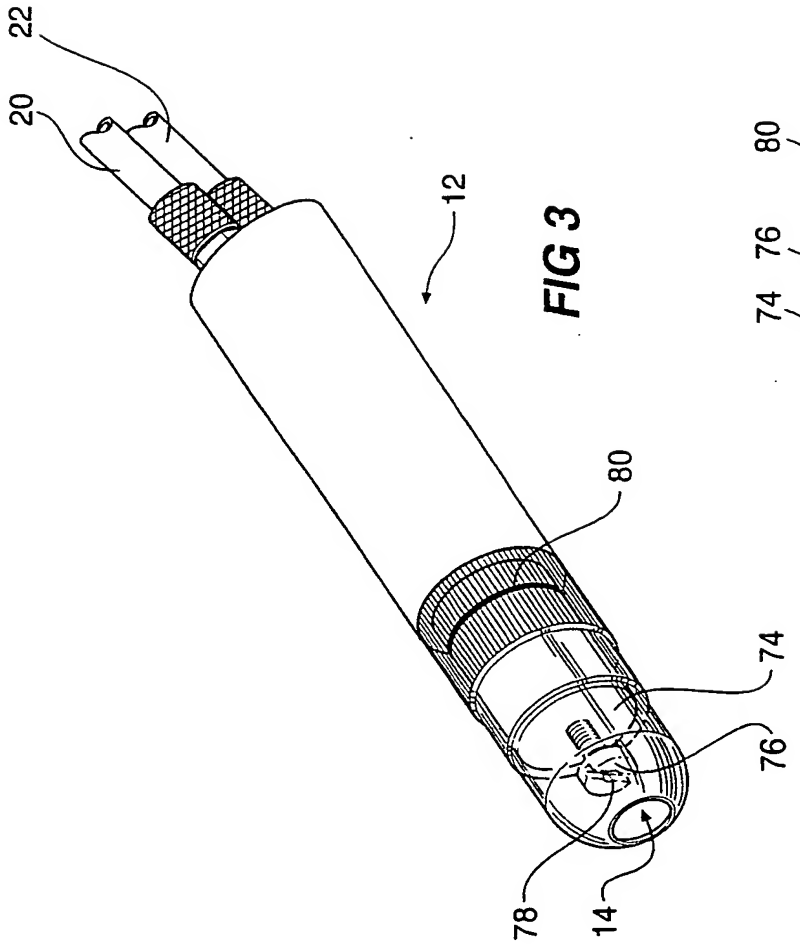

FIG 3

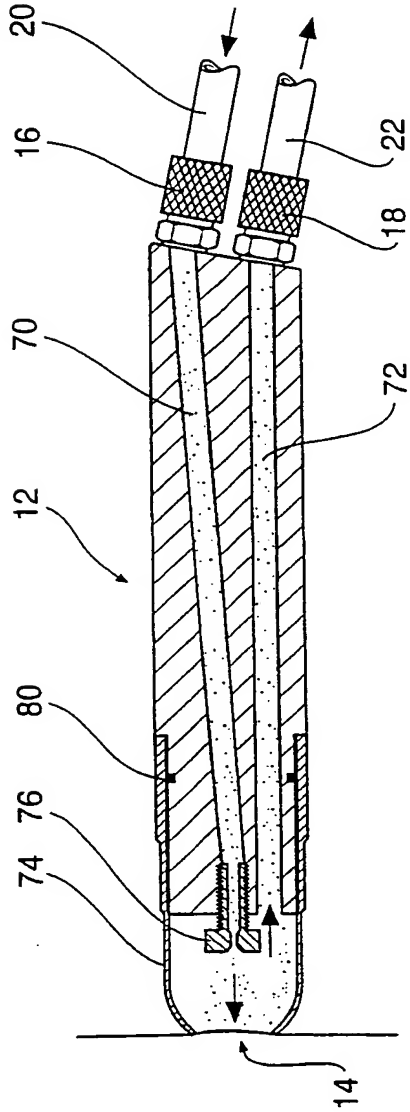

FIG 4

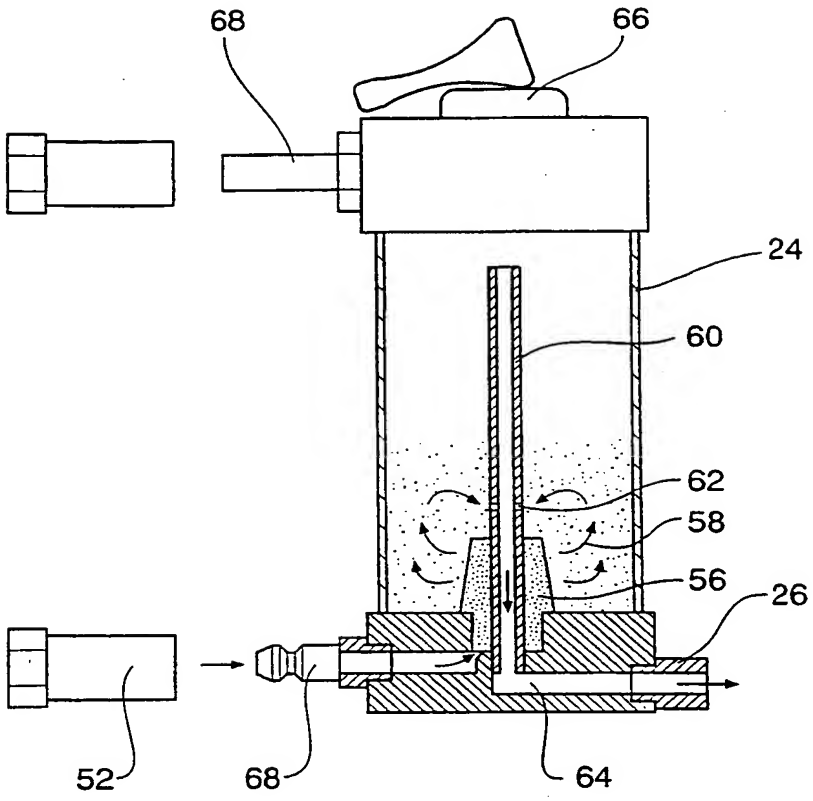

FIG 5

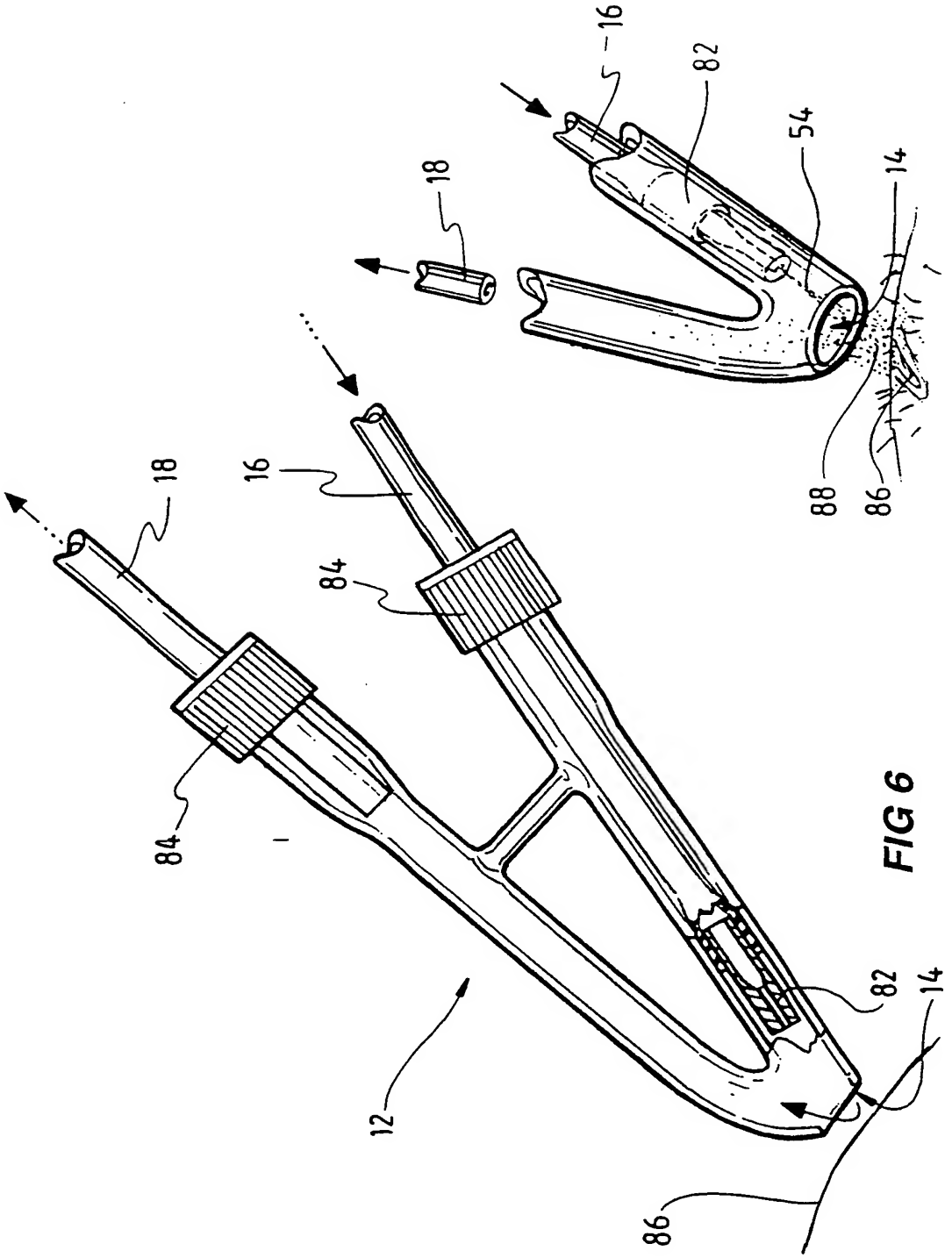

FIG 7

FIG 6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU 98/00936

A. CLASSIFICATION OF SUBJECT MATTER

Int Cl[6]: A61B 17/00 C14B 1/46

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B C14B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
DERWENT
JAPIO

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 564392 A (FRUCTUOSO MARTINEZ) 6 October 1993 column 3 lines 41-44	1-8, 10-12, 17
X	WO 97/11650 A (CAWLEY) 3 April 1997 page 10 line 1 - page 11 line 11	1-8, 10-17
X	EP 318042 A (MOLLNARI et al) 31 May 1989 column 2 lines 27-36	1, 4-8, 10, 12, 13, 15-17

[X] Further documents are listed in the continuation of Box C

[X] See patent family annex

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
17 December 1998

Date of mailing of the international search report
05 January 1999

Name and mailing address of the ISA/AU
AUSTRALIAN PATENT OFFICE
PO BOX 200
WODEN ACT 2606
AUSTRALIA
Facsimile No.: (02) 6285 3929

Authorized officer
D Melhuish
DAVID MELHUISH

Telephone No.: (02) 6283 2426

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU 98/00936

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	EP 806184 A (MATTIOLI ENGINEERING S.R.L.) 12 November 1997 column 2 line 55 - column 3 line 20	1-8, 10-13, 15, 16
A	EP 324448 A (L.I.C.A. di ROSSO & C. S.N.C) 19 July 1989 abstract	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/AU 98/00936

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
EP	564392						
WO	97/11650	AU	70919/96	GB	2319480		
EP	318042	US	5037432				
EP	806184	IT	96300108	JP	10043188		
EP	324448	AU	29248/89	BR	8907135	HU	55211
		IT	1218945	US	5100412	US	5207234
		WO	89/06113				

END OF ANNEX